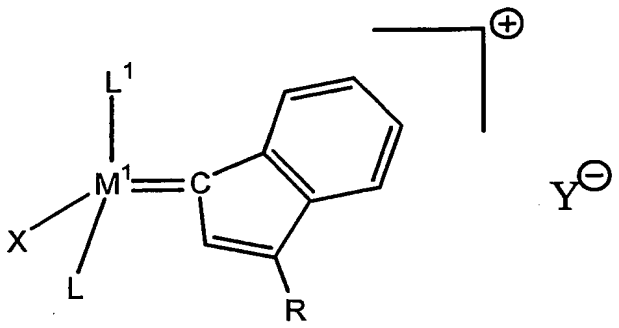
Claims

1. A process for the preparation of an, optionally hydrogenated, nitrile rubber comprising the steps of

a) reacting a nitrile rubber in the presence at least one compound selected from the group consisting of compounds of the general formula I,



Formula 1

wherein:

M^1 is Os or Ru;

R is hydrogen or a hydrocarbon selected from the group consisting of C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, C_1-C_{20} alkyl, aryl, C_1-C_{20} carboxylate, C_1-C_{20} alkoxy, C_2-C_{20} alkenyloxy, C_2-C_{20} alkynyloxy, aryloxy, C_2-C_{20} alkoxycarbonyl, C_1-C_{20} alkylthio, C_1-C_{20} alkylsulfonyl and C_1-C_{20} alkylsulfinyl;

X is selected from any anionic ligand; and

L^1 is a neutral π-bonded ligand, preferably but not limited to arene, substituted arene, heteroarene, independent of whether they are mono- or polycyclic;

L is a ligand selected from the group consisting of phosphines, sulfonated phosphines, fluorinated phosphines, functionalized phosphines bearing up to three aminoalkyl-, ammoniumalkyl-, alkoxyalkyl-,

alkoxylcarbonylalkyl-, hydrocycarbonylalkyl-, hydroxyalkyl- or ketoalkyl- groups, phosphites, phosphinites, phosphonites, phosphinamines, arsines, stibenes, ethers, amines, amides, imines, sulfoxides, thioethers and pyridines;

Y^- is a non-coordinating anion; and optionally further in the presence of at least one co-olefin and

and for the hydrogenated nitrile polymer

b) hydrogenating the product of step a).

2. A process according to claim 1 wherein the nitrile rubber is hydrogenated and the hydrogenation is performed under homogeneous catalytic conditions.

3. A process according to claim 2 wherein the hydrogenation is carried out *in situ*; that is, without first isolating the product of step a).

4. A process according to any of claims 1-3 wherein L is a trialkylphosphine, L^1 is 1-methyl-4-iso-propylphenyl, X is a chloride ion, R is phenyl and M is ruthenium.

5. A process according to any of claims 1-4 wherein the ratio of compound to nitrile rubber is in the range of from 0.005 to 5.

6. A process according to any of claims 1-5 when conducted in the presence of at least one co-olefin.

7. A process according to any of claims claim 1-6 wherein the process is carried out in an inert solvent selected from the group consisting of monochlorobenzene, dichloromethane, benzene, toluene, tetra-hydrofuran and cyclohexane.

8. A process according to any of claims 1-7 wherein the nitrile rubber is hydrogenated and the hydrogenation is carried out using a catalyst of formula :

$$(R^8_mB)_lRhX^3_n$$

wherein each R^8 is independently selected from the group consisting of a C_1-C_8-alkyl group, a C_4-C_8-cycloalkyl group, a C_6-C_{15}-aryl group and a C_7-C_{15}-aralkyl group;

B is selected from the group consisting of phosphorus, arsenic, sulfur, and a sulphoxide group (S=0) ;

X^3 is selected from the group consisting of hydrogen and an anion; and

l is 2, 3 or 4, m is 2 or 3 and n is 1, 2 or 3.

9. A process according to claim 8 wherein the hydrogenation catalyst is $(PPh_3)_3RhCl$.